

Soil Salinity Hazard to Seeds

planting variation to minimize salinity to germinating seeds
successful in field tests with alfalfa in Palo Verde Valley

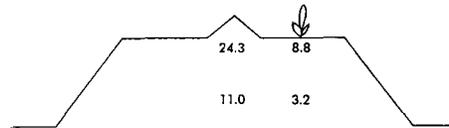
Lloyd Burri, Milton Fireman, and Otis A. Harvey

A perfect stand of Moapa alfalfa in an experimental offset planting—a single row on the shoulder of double row beds—was obtained in an area where soil salinity usually is a hazard to germinating seeds.

In saline areas—such as occur in the Palo Verde Valley—it is frequently difficult to establish satisfactory stands of furrow-irrigated row crops. As irrigation water moves from the furrows into the raised bed, soluble salts are dissolved and carried with the water. The salts tend to accumulate near the center and on the surface of the beds forming a T zone of salt accumulation, which may prevent seed germination or—in milder cases—delay seedling emergence and slow up seedling growth. Such salt accumulation is frequently less troublesome in double row beds because the seeds can be planted on the shoulder of the beds at some distance from the highly saline zone in the center.

Work recently done in the Palo Verde

Typical lettuce beds . . .



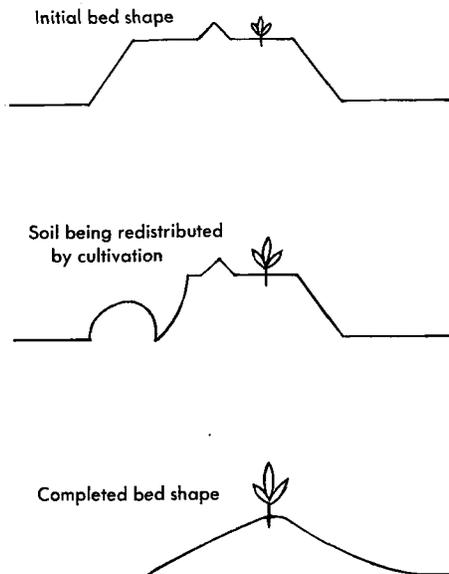
Typical lettuce bed with seed line 4" from shoulder. Salinity values reported as millimhos per centimeter at 25°C in the saturation extract. Soil samples were taken at 0"-1" in the center of the bed, 0"-1" in the seed zone, 0"-6" in the center of the bed, and 0"-6" in the seed zone.

Valley—using planting equipment at hand—indicates that the double row planting method can be used to insure germination in all but the most highly saline areas.

Trial Planting

Moapa alfalfa seed was planted at the rate of one pound per acre with a conventional shaper-planter combination, which ordinarily plants two rows of seed 4" from each shoulder on a bed 20" wide. However, only one row of seed—offset planted on the south side of the bed—was used in the trial. The seed was planted in dry soil and irrigated up. After the first irrigation salinity values were established for various parts of the bed. The salinity values at the sampling sites in the center of the bed were so high they precluded germination of alfalfa.

Steps in the cultivation process of converting from a side row planting to a center row planting.



Seeds in the offset rows—where salinity was only moderately high—germinated very well.

After the alfalfa stand was established, the cooperating grower altered the bed to the equivalent of a center row planting by cultivating with a split-bar cultivator which permitted cultivation in both directions.

This method of offset planting and split-bar cultivation resulted in a perfect stand in an area where germination usually is affected by salinity. Conversion of the offset bed permitted the use of conventional equipment in subsequent cultural operations.

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The Fisher Ranch at Blythe cooperated in the offset planting trials.

. . . converted to a center row planting.

